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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Applicant:	Mark P. Bendett
Title:	APPARATUS AND METHOD FOR INTEGRATED PHOTONIC DEVICES HAVING ADD/DROP PORTS AND GAIN

Docket No.:	1731.010US3	Serial No.: 09/995,404
Filed:	November 27, 2001	Due Date: N/A
Examiner:	Unknown	Group Art Unit: Unknown

Commissioner for Patents
Washington, D.C. 20231

We are transmitting herewith the following attached items (as indicated with an "X"):

X A return postcard.
X A Preliminary Amendment and Clean Version of Pending Claims (12 Pages).

If an additional fee is required due to changes to the claims, the fee has been calculated as follows:

CLAIMS AS AMENDED						
	(1) Claims Remaining After Amendment		(2) Highest Number Previously Paid For	(3) Present Extra	Rate	Fee
TOTAL CLAIMS	18	-	20		x 9 =	$0.00
INDEPENDENT CLAIMS	3	-	3		x 42 =	$0.00
[ ] MULTIPLE DEPENDENT CLAIMS PRESENTED						$0.00
TOTAL						$0.00

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on this 13 day of December, 2002.

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(GENERAL)

S/N 09/995,404 **PATENT**

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PRELIMINARY AMENDMENT

Commissioner for Patents
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Please substitute the claim set in the appendix entitled Clean Version of Pending Claims for the previously pending claim set. The substitute claim set is intended to reflect cancellation of claims 1-20, and addition of new claims 21-38. The specific amendments to individual claims are detailed in the following marked up set of claims.

21. [New] An integrated photonic apparatus comprising:

a glass substrate having a major surface;

an input signal waveguide formed along the major surface of the substrate;

an output signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate;

a drop signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate; and

a first grating formed on the output waveguide, wherein the first grating reflects a first wavelength and is transparent to a plurality of other wavelengths, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths is passed through to an exit interface of the output waveguide.

22. [New] The apparatus of claim 21, further comprising

a second grating formed on the output waveguide,

wherein the first and second gratings are each electrically activatable, and wherein the first grating when activated reflects a first wavelength and is transparent to a plurality of other wavelengths including a second wavelength,

wherein the second grating when activated reflects the second wavelength and is transparent to a plurality of other wavelengths including the first wavelength,
such that when the first grating is activated and the second grating is deactivated the first wavelength is passed to the drop waveguide and the second wavelength is passed through to the exit interface of the output waveguide, and
when the second grating is activated and the first grating is deactivated the second wavelength is passed to the drop waveguide and the first wavelength is passed through to the exit interface of the output waveguide.

23. [New] The apparatus of claim 22, further comprising
an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, wherein the add waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate, and wherein the first grating reflects a first wavelength and is transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

24. [New] The apparatus of claim 21, further comprising
an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, wherein the add waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate, and wherein the first grating reflects a first wavelength and is transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

25. [New] The apparatus of claim 21, wherein all interfaces to couple light between the substrate and external devices are formed at a single face of the substrate other than the major

surface of the substrate.

26. [New] The apparatus of claim 21, wherein each waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate.

27. [New] A method comprising:

providing a glass substrate having a major surface, an input signal waveguide formed along the major surface of the substrate, an output signal waveguide formed along the major surface of the substrate, and optically coupled to the input waveguide, and a drop signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate;

launching input signal into input waveguide;

adding pump light to at least one of the input waveguide and the output waveguide;

receiving a drop-wavelength signal from the drop-signal waveguide; and

selectably applying a first wavelength-sensitive transfer function to light in one of the waveguides that reflects a first wavelength and is transparent to a plurality of other wavelengths, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths is passed through to an exit interface of the output waveguide.

28. [New] The method of claim 27, further comprising

selectably applying a second wavelength-sensitive transfer function to light in one of the waveguides that reflects the second wavelength and is transparent to a plurality of other wavelengths including the first wavelength, such that when the first transfer function is activated and the second transfer function is deactivated the first wavelength is passed to the drop waveguide and the second wavelength is passed through to the exit interface of the output waveguide, and when the second transfer function is activated and the first transfer function is deactivated the second wavelength is passed to the drop waveguide and the first wavelength is passed through to the exit interface of the output waveguide.

29. [New] The method of claim 28, further comprising

providing an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate; and

launching a third wavelength into the add waveguide, wherein the first transfer function reflects a first wavelength and is transparent to a plurality of other wavelengths, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

30. [New] The method of claim 27, further comprising

providing an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate; and

launching a third wavelength into the add waveguide, wherein the first transfer function reflects a first wavelength and is transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

31. [New] The method of claim 27, further comprising

coupling light between the substrate and all external devices from a single face of the substrate other than the major surface of the substrate.

32. [New] The method of claim 27, further comprising

applying a first wavelength-sensitive transfer function to light in one of the waveguides that is complementary to a gain curve of the active species of the substrate in order to flatten a gain curve of the apparatus.

33. [New] An integrated photonic apparatus comprising:

a glass substrate having a major surface;

an input signal waveguide formed along the major surface of the substrate;

an output signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate;

a drop signal waveguide, optically coupled to the input waveguide, and formed along the major surface of the substrate; and

first means for passing a first wavelength to the drop waveguide and passing a plurality of other wavelengths through to an exit interface of the output waveguide.

34. [New] The apparatus of claim 33, wherein the first means selectably pass the first wavelength, and further comprising

means for selectably passing a second wavelength to the drop waveguide while passing the first wavelength through to the exit interface of the output waveguide.

35. [New] The apparatus of claim 34, further comprising

an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, and wherein the first means reflect a first wavelength while being transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

36. [New] The apparatus of claim 33, further comprising

an add signal waveguide, optically coupled to the output waveguide, and formed along the major surface of the substrate, and wherein the first means reflect a first wavelength while being transparent to a plurality of other wavelengths, wherein a third wavelength is launched into the add waveguide, such that the first wavelength is passed to the drop waveguide and the plurality of other wavelengths and the third wavelength are passed through to an exit interface of the output waveguide.

37. [New] The apparatus of claim 33, wherein all interfaces to couple light between the

substrate and external devices are formed at a single face of the substrate other than the major surface of the substrate.

38. [New] The apparatus of claim 33, wherein each waveguide has a higher index of refraction than an index of refraction of adjacent portions of the substrate.